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Studies in Malaysian Annonaceae
I. A revision of *Woodiellantha*

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Summary. A revision of the genus *Woodiellantha* is presented with a general discussion of the systematic position of the genus and morphology. Two species are recognised, *W. sympetala* (Merr.) Rauschert and *W. grandifolia* (Airy Shaw) Mat-Salleh & Latiff, the latter newly elevated to specific rank. A key to the species and distribution data are also given.

Merrill (1922) published the generic name, *Woodiella* when he described the single species, *W. sympetala* from Sabah. However, the generic name *Woodiella* Merr. constitutes a later homonym for the name *Woodiella* Saccardo & Sydow which is for a fungus described in 1899. According to the International Code of Botanical Nomenclature (Art. 7.9), the name *Woodiella* should be used for the fungus genus, and the genus *Woodiella* (Annonaceae) should adopt the name *Woodiellantha* (Merr.) Rauschert (Rauschert 1982). Unknowingly, *Woodiella* was perpetuated by the authors when redescribing the species *W. sympetala* and discussing its rediscovery in Sabah (Mat-Salleh & Latiff 1989).

SYSTEMATIC POSITION OF THE GENUS

Merrill (1922) originally suggested that *Woodiellantha* approximates to *Papualthia* Diels, a genus restricted to the Philippines and New Guinea, because the flowers of *Woodiellantha* have united petals in the lower half. In contrast, Sinclair (1956) considered *Woodiellantha* closer to *Polyalthia* Blume. This was also mentioned as a possible alliance by Merrill (1922) because both genera have a single basal ovule. This is not surprising as Sinclair (1956) also considered the genus *Polyalthia* being the central genus in the tribe Unoneae, from which other small genera are thought to have evolved. However, Merrill (1922) stressed that *Woodiellantha* cannot be considered closer to *Polyalthia* than *Papualthia* because members of *Polyalthia* do not have petals connate at the base. It was suggested that both *Papualthia* and *Woodiellantha* might have been derived from *Polyalthia* through some modification of the petals.

Kessler (1993) placed *Woodiellantha* together with the genera *Enantia* Oliver, *Cleistochlamys* Oliver, *Disepalum* Hook. f. and *Fenerivia* Diels in an informal group "Enantia". The Enantia group is characterised by their valvate sepals and petals, connectives with truncate dilated apex, and one basal ovule. The first two genera are exclusively African, while *Disepalum* is West Malesian and the last is Madagascan.

In her comprehensive analysis of floral morphology of Annonaceae, van Heusden (1992) argued that *Woodiellantha* should be related to *Enicosanthum* Becc. Based on our field observation of the flowers of *W. sympetala* in Sabah, the authors agree with the statement of van Heusden (1992). *Woodiellantha* cannot be considered closer to *Polyalthia* because of their different floral morphology. It is not just because the petals of *Polyalthia* are free, equal and spreading versus connate at the base in *Woodiellantha* but in addition, the petals of the latter are coriaceous and constricted at the middle, forming a pouch-like base, so much like those in *Enicosanthum*. Also, although the petals of some *Papualthia* species are connate, others are free. Furthermore, *Papualthia* has numerous lateral ovules rather than a single basal ovule as found in *Woodiellantha*, a feature that is also characteristic of *Enicosanthum*. Lastly, *Papualthia* has not been reported in Borneo but is restricted to the Philippines and New Guinea while *Woodiellantha* is endemic to Borneo.

MORPHOLOGY

The leaves of *W. sympetala* are relatively smaller (10–35 × 8–13 cm) than those of *W. grandifolia* (40–50 × 15–21 cm). As might be expected, the number of vein pairs is greater in the latter. The leaf base is cuneate in the former and semi-cordate in the latter. The texture, apex, and margin of the leaves are very similar in both species.

The flowers of both species are very similar. They are bisexual, and occur in few-flowered fascicles, being either rami- or cauliflorous. The three sepals are valvate and connate at base. The six petals are valvate and occur in two whorls, being wholly connate for the lower portion, *c.* 1 cm from the base and slightly oblique. The stamens are numerous and the connective has a truncate dilated apex.

The number of carpels is similar in both species. However, the monocarps are quite different, oblong to ovoid in *W. sympetala* and oblong in *W. grandifolia*. In both species, the apex of the carpels is short-stipitate but in the former the external surface is sometimes velvety.

KEY TO *WOODIELLANTHA* SPECIES

Leaves relatively small, 10–35 × 8–13 cm; oblong to lanceolate; base cuneate; veins 12–17 pairs; carpels less than 5 cm long, ovoid, sometimes velvety ..... 1. *W. sympetala*

Leaves relatively large, typically 40–50 × 15–21 cm; oblanceolate; base semi-cordate; veins 19–24 pairs; carpels more than 6 cm long, oblong, glabrous ..... 2. *W. grandifolia*

1. Woodiellantha sympetala (Merr.) Rauschert, *Taxon* 31 (1982) 555.

Woodiella sympetala Merr., *J. Str. Br. Roy. As. Soc.* 85 (1922) 188-189; Sinclair, *Sarawak Mus. J.* 5 (1951) 598; Mass & Th. Westra, *Bot. Jahrb.* 105 (1985) 178-179; Mat-Salleh & Latiff, *Malay. Nat. J.* 42 (1989) 271. Type: *Wood* 1301, Borneo, Sabah, no locality (holotype K).

Small tree, up to 6 m tall; bole *c.* 12 cm diameter. Crown conical with horizontal branches. Twigs glabrous. Leaves oblong to lanceolate, rarely elliptic, 10–35 × 8–13 cm, subcoriaceous, upper surface shiny green, glabrous and lower surface pale green with raised yellow veins; base cuneate sometimes obtuse; margin entire; apex acuminate; lateral veins 12–17 pairs, upper side faint to inconspicuous, lower side rather prominent, *c.* 0.7 cm apart; leaf stalks *c.* 0.5 cm long. Flowers fasciculate, ramiflorous and cauliflorous; green turning yellow-cream and later dark red-brown with yellowish-green base when fully mature; pedicels *c.* 4 cm long or slightly shorter, sparsely pubescent. Calyx lobe 3, *c.* 8 × 15 cm, green, ovate, connate at base, valvate. Petals 6, valvate in two series, the upper part free but the lower part (for *c.* 1 cm from the base) fused into one whorl; the free portions of the outer petals elliptic-oblanceolate, up to 5 cm long, 15–20 mm wide when fully mature, the inner slightly smaller, narrowly oblanceolate, both whorls contracted near the connate base thus forming the pouch-like bases with spreading free corolla lobes. Stamens numerous, *c.* 3 mm long with truncate connectives, thecae distinct. Carpels numerous, ovoid, pubescent with long brown hairs at the base, stigma cylindrical-orbicular, pubescent with very fine hairs. Fruit monocarps ovoid, 5–6 cm long, smooth when fresh, wrinkled when dry, forming several interconnecting ridges, glabrous or velvety, pedicels 1.5–3 cm long, apex blunt-acuminate. Seed one, basally attached, aril thin.

SPECIMENS EXAMINED—SABAH: Sandakan, *Ramos* 1562, 1808 (K, SAN), *Villamill* 262 (K), *Wood & Wyatt-Smith* SAN 4544 (SAN), Segaliud Lokan F.R., *Aban & Leopold* SAN 80984 (K, SAN), Kabili-Sepilok FR, *Castro* 4423 (K), *Keith* 6298 (K); Lahad Datu, *Ampun & Talip* SAN 68451 (SAN), Masuli, *Fabia* A 4008 (K, SAN); Ranau, Mount Kinabalu, Dallas, *J. & M.S. Clemens* 26539 (K, SAN), Tenompok, *J. & M.S. Clemens* 28539 (BM), Mount Kinabalu foothills, *J. & M.S. Clemens* 26471, 26509 (K), Tampias, *Amin G. et al.* SAN 94383 (K, SAN), *Amin & Pius* SAN 69491 (SAN); Poring, *Mat-Salleh* KMS 2173 (UKMB); Beluran, *J.J. Vermeulen* 454 (L, SAN), Ladang-ladang, *Ismail, Francis & Donggop* 67291 (K, SAN); Tenom, Crocker Range, Kg. Melutut, *Mat-Salleh & Latiff* KMS 2136 (UKMB); Sook, Trusmadi Range, *Zarinah Wagiran* 118 (UKMB), *Wan A. Latiff* 99 (UKMB), Kg. Nadangan, *Mat-Salleh & Wan A. Latiff* KMS 1702, 1925, 1932, 1960 (UKMB); no locality given, *Wood* 1301 (type, K).

VERNACULAR NAMES. *karai*, *pisang-pisang*.

DISTRIBUTION. Endemic to Sabah.

HABITAT. Generally found in riverine vegetation on ultrabasic forest, sometimes on granite outcrops from lowlands to the foot of Mount Kinabalu and other mountains, especially on the Trus Madi range.

2. Woodiellantha grandifolia (Airy Shaw) Mat-Salleh & Latiff, **comb. & stat. nov.**

Woodiella sympetala var. *grandifolia* Airy Shaw, *Kew Bull.* 6 (1939) 284. Type: *P. W. Richards* 1574, Sarawak, 4th Division, Dulit, alt. 400 m (holotype K!).

Tree up to 8 m tall; bole *c.* 24 cm diameter. Twigs glabrous. Leaves oblanceolate becoming subpandurate, (36–)40–50 × (8.2–)15–21 cm, chartaceous, upper and lower surfaces smooth, base semi-cordate, margin entire, apex apiculate; lateral veins 19–24 pairs, upper side grooved, lower side prominent, elevated; reticulations scalariform; leaf stalks *c.* 1 cm long, thick. Flowers fasciculate, mostly ramiflorous, rarely cauliflorous, connate at base; oblong, 3 × 1.6 cm, glabrous. Calyx 3, 0.5–10 mm long, calyx lobe cupuliform, yellow. Petals 6, inner petals mostly free, outer petals connate at the base, fused into a whorl, not prominently constricted in the middle, cream turning yellow, valvate; stamens numerous, white. Stigma yellow; ovaries numerous, cylindrical. Fruit monocarps up to 6 cm long and 2 cm diameter, glabrous; the pedicels *c.* 1.5 cm long, oblong, grey-green, when dry manifestly alate, apex blunt, acuminate to one side, the peduncle *c.* 3.8 cm long, 1-seeded. Seed 3.4 × 1.7 cm, cerebriform, with long groove. (Fig. 1)

SPECIMENS EXAMINED—SARAWAK: 4th Division, Dulit, alt. 400 m, *P.W. Richards* 1574 (type K), Mount Dulit, *Dayang Awa & P.C. Yii* S. 46616 (K, SAR); Ulu Mayeng, basalt hillside, alt. 100 m, *Sibat ak Luang* S. 21703 (K, SAR), S. 21784 (SAR, K); Simunjan, Jeneong, *Brooke s.n.* (SAR); Tau Range, Sungai Mayeng, *Purseglove* P 5316, P 5330 (K, L, SAR).

DISTRIBUTION. Endemic to Sarawak.

HABITAT. Found in forests on basalt as well as mixed dipterocarp forests on sandstone, up to 400 m above sea level.

This species was formerly described by Airy Shaw (1939) as a variety of *W. sympetala* and was treated as such ever since. On closer study it is found to be quite different from the typical *W. sympetala*, hence it is elevated to specific rank. It may be recognised by its large, subpandurate-oblanceolate leaves, semi-cordate leaf base and large, oblong carpels. The habitat and the flowering periods of the two species also differ. Airy Shaw (1939) also noted that the leaves of *W. sympetala* have the tendency to be subpandurate, but observations of all available specimens did not show that characteristic.

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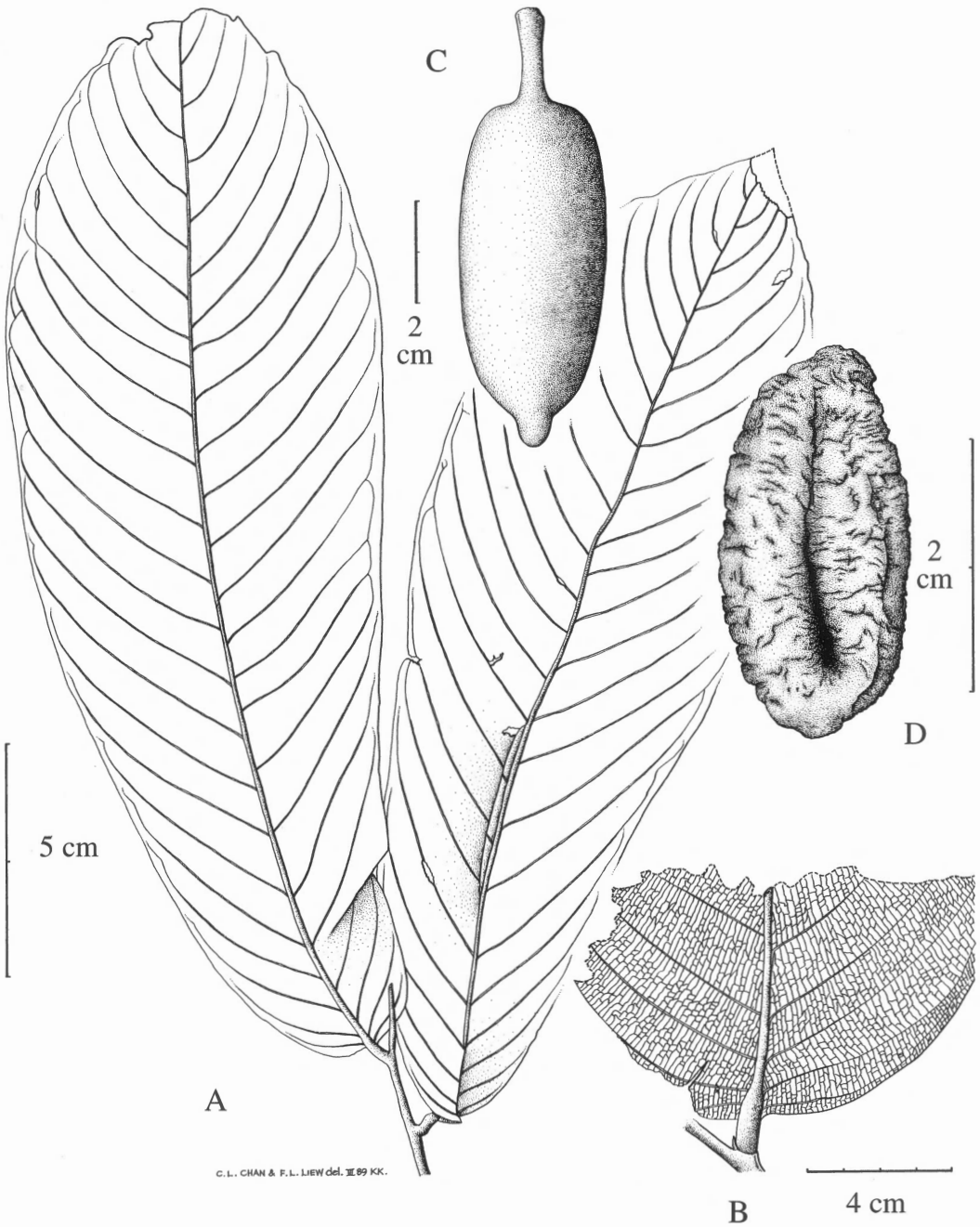

Fig. 1. *Woodiellantha grandifolia*. **A.** Leaves showing the lateral veins. **B.** Detail of vein reticulations in the leaf. **C.** Fruit. **D.** Seed (note the cerebriform testa). All drawn from *Purseglove* P. 5316 by C.L. Chan and F.L. Liew.

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